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Customer No. 27061
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Patent
Attorney Docket No. GEMS8081.221

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Hoffman et al.
Serial No. : 10/711,329
Filed : September 10, 2004
For : METHOD AND SYSTEM OF DYNAMICALLY CONTROLLING
SHAPING TIME OF A PHOTON COUNTING ENERGY-
SENSITIVE RADIATION DETECTOR TO ACCOMMODATE
VARIATIONS IN ...
Group Art No. : 2882
Examiner : Hoon K. Song

CERTIFICATION UNDER 37 CFR 1.8(a) and 1.10

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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Dear Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments have been made with this request. The request is being filed with a Notice of Appeal. The review is requested for the reasons set forth hereinafter.

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REMARKS

Claims 1-23 are pending in the present application. In the Final Office Action mailed May 18, 2006, the Examiner rejected claims 1-23 under 35 U.S.C. §103(a) as being unpatentable over Hsieh (USP 5,416,815) in view of Mazor et al. (US Pub. 2002/0001365) "Mazor."

This request is believed proper because the Examiner has used impermissible hindsight to combine Hsieh in view of Mazor. Such a combination defeats the purpose of Hsieh and completely ignores the teaching principle of Hsieh. Furthermore, Mazor is not analogous prior art. This is not simply an issue about what the combined teaches of the references would have suggested to those of ordinary skill in the art, but a complete disregard of the requirement that cited art be in the same field of endeavor or reasonably pertinent thereto, and that the combination of references cannot result in rendering the reference useless.

The Examiner rejected claim 1 as being unpatentable over Hsieh in view of Mazor. Hsieh was relied upon for its disclosure of a detector receiving radiographic energy after passing through a patient, outputting a signal indicative of the detected energy, and sampling in a sampling window and providing a photon count output. *Office Action, Pg. 2*. Mazor was relied on for allegedly disclosing a photon counting system "configured to automatically adjust the sampling window (sensitivity) at least as a function of the given flux rate." *Office Action, Pg. 2 to Pg. 3*.

Claim 1 calls for, in part, a PC channel connected to receive the electrical signals and sample the electrical signals in a sampling window and provide a photon count output, and a control operationally connected to the PC channel and configured to automatically adjust the sampling window at least as a function of the given flux rate. Applicant disagrees that the combination of Hsieh and Mazor suggests the claimed invention to one of ordinary skill in the art.

Hsieh discloses a CT system where streaking artifacts are reduced by adaptively filtering projection data. *Hsieh, Abstract*. The artifacts occur when x-ray flux is attenuated and results in low x-ray count, which manifests itself as horizontal streaks in the reconstructed image. *Hsieh, Col. 1, Ins. 40-48*. Fluctuation in the attenuation values at very low detector readings is removed by an adaptive filter, which includes a function generator 60 that compares each scan data value and determines in which region each value lies, and from that a window function W is produced to control the degree of filtering applied to each corresponding attenuation value. *Id., Col. 3, Ins. 29-56*. First pass error vector ϕ and final error vector θ are generated to first filter, and then refine the data for image reconstruction, by replacing data of saturated regions with average

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values of adjacent regions. *Id.*, Col. 3, ln. 57 to Col. 4, ln. 50. Thus, Hsieh discloses an adaptive filter wherein an algorithm is used to generate replacement data for saturated data.

Mazor discloses an x-ray detector for x-ray reflectometry. A reflectometer relies on the principle of "reflections" of x-rays to obtain information for analysis. Mazor further discloses that x-ray reflectometry is well-known in the art as a "technique for measuring the thickness, density and surface quality of thin film layers deposited on a substrate." *Mazor*, Para. 2. As shown in Fig. 1 of the patent, x-ray reflectometry involves the projection of x-rays toward a substrate. The reflectance of x-rays off that substrate are then detected and measured to determine layer thickness, density and surface quality, resulting in "reflectometry." Notably, the x-rays that are detected are not those that pass through or are attenuated by an object to be imaged. In fact, x-ray reflectometry, by definition, is directed to the detection of x-ray reflectance and not x-rays that have passed through and attenuated by an object to be imaged. Moreover, x-ray reflectometry is not directed to the imaging of an object. X-ray reflectometry is directed to determine characteristic qualities, such as thickness, density, and surface quality, for a thin film layer on a substrate.

I. The Examiner has used impermissible hindsight in combining Hsieh in view of Mazor.

MPEP §2145(X)(A) states "any judgement on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper." *In re McLaughlin* 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971).

The Examiner alleges that one skilled in the art would be motivated to combine the teachings of the references in such a way as to render the claims of the present invention obvious. Applicant respectfully disagrees and submits that the two cited references act on totally different principles. Hsieh discloses an adaptive filter wherein an algorithm is used to generate replacement data for saturated data. In other words, Hsieh discloses a technique that allows for, or tolerates, detector saturation to occur, and an algorithm to generate lost data from the saturated region of the detector. Mazor discloses that reflectance of x-rays off the substrate are detected and measured to determine layer thickness, density and surface quality. Where Hsieh teaches correction, Mazor teaches prevention of saturation in the first instance.

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The two disclosures are diametrically opposed to one another. That is, one (Hsieh) allows for saturation, then takes corrective action, while the other (Mazor) attempts to prevent saturation in the first place. Hsieh discloses an algorithm that is used to generate replacement data for saturated data. In combining Hsieh and Mazor, the Examiner has suggested a use for Hsieh that totally undermines the reason for Hsieh in the first place. In other words, the novelty of Hsieh is, after experiencing detector saturation, data is replaced by using information from other cells within the detector. The Examiner is ignoring the central teaching principle of Hsieh – to tolerate saturation and then correct therefore. Such a combination undermines the corrective measures of Hsieh. Instead, the Examiner has combined the cited references based on the exact teaching of the Applicant. The Examiner has improperly reached his conclusion by using the present application as a roadmap to piece together the cited references in such a way that does not make sense to one skilled in the art.

Applicant believes the Examiner has not established that the combined teachings would have suggested to one skilled in the art to replace the detector assembly of Hsieh with one of the type used for x-ray reflectometry. Doing so would render the novelty of Hsieh moot.

II. Mazor is not analogous art.

MPEP §2141.01(a)(I) states “to rely on a reference under 35 U.S.C. 103, it must be analogous prior art.” Specifically, “[i]n order to rely on a reference as a basis for rejection of an applicant’s invention, the reference must either be in the field of applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.” *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

Mazor discloses a “technique for measuring the thickness, density and surface quality of thin film layers deposited on a substrate,” wherein the reflectance of x-rays off the substrate are then detected and measured to determine layer thickness, density and surface quality. Applicant submits that one skilled in the art would not find a “technique for measuring the thickness, density and surface quality of thin film layers deposited on a substrate,” by using a reflective technique, to be “reasonably pertinent” to the problem related to imaging with a CT system, wherein x-rays pass through and are attenuated by an object to be imaged rather than reflected. Two very different systems and techniques.

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Accordingly, that which is called for in claim 1 is not disclosed or taught in the art of record. As such, Applicant believes claim 1, and the claims which depend therefrom, are patentably distinct over the art of record.

The Examiner rejected claims 8 and 18 as being unpatentable over Hsieh in view of Mazor. Both Hsieh and Mazor are discussed above and for the reasons presented with reference to claim 1, claims 8 and 18 are also believed neither anticipated nor obvious over the art of record. The corresponding dependent claims are believed allowable for the same reasons as independent claims 8 and 18 as well as for their own additional characterizations. Accordingly, this rejection is also not sustainable.

Withdrawal of all pending rejections is therefore respectfully requested. In light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance.

Applicant appreciates the Panel's consideration of this Request and respectfully requests timely issuance of a Notice of Allowance.

Respectfully submitted,

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